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REMARKS

Claims 1-16 were originally presented in the subject application. No claims have herein been amended, added or canceled. Therefore, claims 1-16 remain in this case.

The addition of new matter has been scrupulously avoided. In that regard, the amendment to the specification merely corrects a minor typographical error.

Applicants respectfully request reconsideration and withdrawal of the grounds of rejection and objection.

The Office Action objected to the specification, requiring that a space be added at page 11, line 7, "signal36." In response, Applicants have amended the specification as required. As amended, Applicants submit the objection has been overcome.

The Office Action rejected claims 1-3, 5, 7, 9-11, 13 and 14 under 35 U.S.C. §102(a), as allegedly anticipated by Colomes et al. ("A Perceptual Model Applied to Audio Bit-Rate Reduction," J. Audio Eng. Soc. Vol. 43, pp. 233-240, April 1995). Applicants respectfully, but most strenuously, traverse this rejection.

With respect to the anticipation rejection, it is well settled that a claimed invention is not anticipated unless a single prior art reference discloses: (1) all the same limitations of the claimed invention; (2) found in the same situation as the claimed invention; (3) united in the same way as the claimed invention; (4) in order to perform the identical function of the claimed invention. In this instance, Colomes et al. fails to disclose multiple limitations of each of the independent claims and as a result does not anticipate, or even render obvious, applicants' invention.

Claim 9 recites a system for determining an objective audio quality measurement of a target audio signal. The system comprises a peripheral ear processor for processing a reference audio signal and a target audio signal to provide a reference basilar sensation signal and a target basilar sensation signal, respectively. The system further comprises a comparator for comparing the reference basilar sensation signal and the target basilar sensation signal to determine a basilar degradation signal, and a cognitive processor for processing the basilar degradation signal to

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determine at least one cognitive model component for providing an objective perceptual quality rating.

Against the claimed peripheral ear processor, the Office Action cites to Colomes et al. at page 238, left column, paragraphs 3-5; and page 234, right column, paragraph 2. More specifically, the Office Action equates the artificial ear of Colomes et al. with the claimed peripheral ear processor, the minimum masking curve level of Colomes et al. with the claimed processing of a reference audio signal, and maximum audio signal level of Colomes et al. with the claimed target audio signal.

Applicants submit that the cited sections of Colomes et al. have nothing to do with the Colomes artificial ear and nothing to do with basilar sensation. The cited section of page 238 of Colomes et al. describes two different techniques to calculate the signal-to-mask ratio. The signal-to-mask ratio is actually not calculated in the artificial ear, but is calculated inside an ISO MPEG Layer II encoder (more specifically, by a psychoacoustical model inside the encoder) in order to perform bit allocation and quantization. The "minimum masking curve level" of Colomes et al. is the computed signal level below which the signal should be undetectable, and the "maximum audio signal level" is the maximum level within the same audio frame that is compared to the minimum masking curve level to decide whether or not the maximum signal should be detectable. The magnitude of the signal-to-mask ratio is used to make this determination.

In contrast, in the present application, the claimed reference audio signal is the actual level of the input signal and not a "masking curve level" computed using an auditory model. Similarly, the claimed "target audio signal" is the level of the input signal containing distortion. These two signals are subtracted to yield a basilar sensation signal that is used in a later stage of processing to derive other parameters different from the signal-to-mask ratio.

Thus, Applicants submit that Colomes et al. fails to disclose, teach or suggest the claimed peripheral ear processor.

Against the comparator of claim 9, the Office Action cites to Colomes et al. at page 238, left column, paragraphs 5 and 6. However, as noted above, this section addresses calculating the

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signal-to-mask ratio inside the encoder part of one particular codec, namely, the ISO MPEG Layer II codec. The cited section has nothing whatever to do with the claimed basilar sensation and basilar degradation signals.

Thus, Applicants submit that Colomes et al. fails to disclose, teach or suggest the claimed comparator.

Against the cognitive processor of claim 9, the Office Action cites to the spreading function of Colomes et al. at page 235, left column, last paragraph to page 235, right column, second paragraph; and page 234, left column, paragraphs 4 and 5.

However, the (cochlea) spreading function of Colomes et al. is merely one element used in a peripheral ear model to calculate the so-called "total excitation pattern." It is clear from the progression of the limitations in claim 9 that the cognitive processor comes after the peripheral ear processor in the processing path of the claimed system. For example, the reference basilar sensation signal is provided by the peripheral ear processor, while the comparator uses that signal to determine the basilar degradation signal, which the cognitive processor then processes. The spreading function of Colomes et al., therefore, has nothing to do with the claimed cognitive processor. Moreover, Applicants submit Colomes et al. does not disclose, teach or suggest a cognitive processor per se, and only describes one particular implementation of a peripheral ear model.

In addition, the cognitive processor of claim 9 provides an objective perceptual quality rating. Although the objective perceptual quality rating is not specifically addressed by the Office Action, Applicants submit that, at best, Colomes et al. is directed to the evaluation of the detectability of quantization noise in audio codecs (see Colomes et al. at page 238, first paragraph of section 3), and not an objective perceptual quality rating. One skilled in the art will know that an audio quality perceptual measurement is a number indicating the overall perceived quality of a target audio signal on a subjective rating scale, for example, the ITU-R whole integer, five-grade impairment scale. Moreover, Colomes et al. is merely presenting a proposed model, with no validation by testing with human subjects. Such is made quite clear in the conclusion on page 238:

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Future work will be concerned with further improvements and extensive validation experiments of the model, application as an objective measure in the adjustment of codecs . . . **as well as an application of the model in an objective quality measure system.**

Thus, Applicants submit that Colomes et al. fails to disclose, teach or suggest the claimed cognitive processor.

For all the reasons noted above, Applicants submit that claim 9 is not disclosed, taught or suggested by Colomes et al.

With regard to claim 1, the Office Action treats claim 1 in a summary fashion by referring to claim 9. Thus, Applicants likewise refer to the remarks made above with respect to claim 9.

Applicants submit that the dependent claims are allowable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their additional limitations.

For example, the Office Action rejected claims 8 and 16 under 35 U.S.C. §103 as allegedly obvious over Colomes et al. in view of "ITU-R BS 1387." Applicants respectfully, but most strenuously, traverse this rejection.

As an initial matter, it is important to clarify which ITU-R document is being combined with Colomes et al. Although the document provided with the Office Action consists of recommendations for corrections to ITU-R BS 1387 (a document that came after ITU-R BS 1387), and ITU-R BS 1387-1 (approval of recommendations) was previously cited, it is Applicants' understanding that the document being cited is the original ITU-R BS 1387. It also appears that the Office Action assumes ITU-R BS 1387 is the equivalent of ITU-R BS 1387-1 minus the document recommending changes to ITU-R BS 1387.

It is clear that both the recommendation for corrections and the 1387-1 revised document were published after the filing of the present application. It is Applicants' contention that the original ITU-R BS 1387 document does not contain the subject matter that is being cited against claims 8 and 16.

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Applicants authored the original ITU-R BS 1387 document. As such, they are aware of its contents, which did not include the subject matter of claims 8 and 16. If the Examiner contends otherwise, he is respectfully requested to produce the actual document being cited and point to where the subject matter of claims 8 and 16 is disclosed. Until that occurs, Applicants contend that a *prima facie* case against claims 8 and 16 has not been made. Neither of the documents pointed to are valid prior art, and there is no evidence that the assumption of '1387-1 minus recommendations equals 1387' is valid. In fact, the inventors, having authored 1387, submit that the assumption is incorrect.

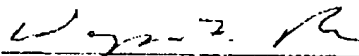
Therefore, Applicants submit that claims 8 and 16 cannot be made obvious over Colomes et al. in view of ITU-R BS 1387.

#### CONCLUSION

For all the above reasons, Applicants maintain that the claims of the subject application define patentable subject matter and earnestly request allowance of claims 1-16.

If a telephone conference would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,

  
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